Abstract

Charles University in Prague
Faculty of Pharmacy in Hradec Králové
Department of Analytical Chemistry

Candidate: Petra Staňková
Supervisor: Prof. RNDr. Petr Solich, CSc.
Title of Diploma Thesis: Study of compounds influencing the antimicrobial effect of honey

Honey has many beneficial effects, but nowadays the antibacterial effect is the most appreciate one. This activity is due to many factors - the low pH, a small amount of water, high osmolarity, the presence of hydrogen peroxide, methylglyoxal, bee-defensin 1 peptide and other substances. However, all the substances contributing to this effect still have not been found and therefore we do not know the exact mechanism of antibacterial activity. Clarification of this situation could help with solving the problem with antibiotic resistant bacteria.

This work aimed to confirm the presumption that substances structurally close to gentamicine are in honey. Seven samples of honey from France and one with German origin were used for this research. It included monofloral honeys and mixed ones, whose nectar was collected from several plant species. The extraction by dichloromethane was performed to eliminate the sugar. After derivatization by fluorescamine these substances were initially separated on a column of high performance liquid chromatography with a reverse phase, and then a normal stationary phase was used. The presence of these substances was not probably detected by fluorescence detector.

After the change of method to thin layer chromatography, a fluorescent stain at each honey sample was seen under UV radiation at wavelengths of 254nm and 356nm. In this case, honey was dissolved in water or methanol. These spots were detectable in both cases, with or without spraying with fluorescamine solution. It cannot be confirmed nor excluded that detected fluorescent spots are related to the original aim of the work, although during the Maillard reaction the fluorescent substances are produced. For more information it would be necessary to separate and identify these substances.
Keywords: honey, antibacterial effect, TLC, HPLC, fluorescamine